



Effectiveness of Academic Supervision Models in Improving Teacher Performance in Kindergarten Schools

W. HIDAYATI, T. J. RAHARJO, J. SUTARTO, WIDIYANTO

ABSTRACT

Introduction. Global education initiatives championed by organizations such as UNESCO, the Council of Europe, and the International Association of Universities (IAU) emphasize continuous professional development for educators as the cornerstone of quality education. In line with these initiatives, implementing academic supervision models in early childhood education settings, such as kindergartens, is important in improving teacher performance. Academic supervision is a key mechanism for improving teaching practices, ensuring educators can meet the demands of an increasingly complex educational environment. *This study aims* to evaluate the effectiveness of an academic supervision model in improving kindergarten teachers' performance, focusing on the changes observed before and after the implementation of this model. As such, this study contributes to the ongoing global discourse on improving the quality of education through targeted professional development strategies.

Study participants and methods. The study involved six kindergarten teachers selected through purposive sampling. Data was collected using pretest and posttest evaluations, measuring teacher performance before and after implementing the academic supervision model. Descriptive statistics, t-tests, and Wilcoxon Signed Rank tests were used for data analysis. The normality of the data was assessed using the Shapiro-Wilk test. N-Gain scores were calculated to determine the relative improvement in performance.

Results. The essence of the pedagogical model used in this study is to improve teacher performance through academic supervision focused on continuous professional development. Improved performance was seen through a comparison of pretest and post-test mean scores; scores increased from 16.33 to 28.33 with a higher variance value (0.667) on the pretest, meaning that pretest scores had a greater spread, indicating that teachers' performance levels were initially highly variable. After implementing the model, the lower variance (0.267) in the posttest indicates that teacher performance scores became more uniform and concentrated at higher scores. This indicates that the academic supervision model effectively improved teacher performance through a t-test with a significance value of 0.000 ($p < 0.05$), indicating a significant difference between the pretest and post-test scores. The t-test and Wilcoxon signed rank test confirmed that the difference between pretest and posttest scores was statistically significant, further validating the effectiveness of the supervision model. N-Gain analysis, with an average score of 0.8772, highlighted significant and measurable improvements in teacher performance after implementing the academic supervision model.

Conclusion. This study confirms the effectiveness of the academic supervision model in enhancing teacher performance. The model improved individual teacher competencies and ensured a uniform teaching quality across the board. These findings suggest that implementing academic supervision consistently could serve as a strategic approach for professional development in educational settings.

KEYWORDS

academic supervision, teacher performance, professional development

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INTRODUCTION

In the context of global education initiatives led by leading organizations such as UNESCO, the Council of Europe, and the International Association of Universities (IAU), the continuous professional development of educators is recognized as a critical component in improving the quality of education worldwide. Academic supervision is one of the main methods for improving teacher performance, especially in basic education settings such as kindergartens. This international initiative emphasizes the need for a robust supervision model that facilitates continuous professional development for teachers, ultimately aiming to improve educational outcomes in a variety of settings.

Academic supervision is one of the important methods in improving the quality of teacher performance [33], especially in basic education settings such as kindergartens. Supervision models, particularly academic supervision, are important in facilitating teachers' continuing professional development [4]. A well-implemented supervision model can lead to significant improvements in teaching practices [34], thereby enhancing students' learning experience. However, the extent to which these models are effective in specific educational settings, such as kindergartens, remains unexplored. This study addresses this gap by examining the impact of an academic supervision model on kindergarten teachers' performance, focusing on changes in their performance before and after the intervention.

The proposed model is expected to address existing problems and improve the effectiveness of academic supervision, focusing on improving the quality of the teaching and learning process and teachers' professional development. There is a positive correlation between supervision and teaching quality [28]. Academic supervision is defined as services that assist, encourage, guide and nurture teachers to improve their abilities and skills in carrying out educational tasks [31]. Academic supervision is an important component in improving the quality of teaching and teacher performance. This involves various activities that aim to support and guide educators to better carry out their roles. Effective academic supervision requires a teaching-learning approach, emphasizing specific strategies that characterize high-quality teaching and mentoring, which is critical for principals and supervisors collaborating with teachers to enhance instructional leadership [17].

Teachers are educated to respond to the various roles required by the complexity of the social and economic conditions in which we live [1]. Teacher support is important for children's learning [5]. Supervision helps teachers in schools find out the shortcomings and advantages of teaching performance in the classroom and helps them improve the teaching and learning process to be more effective in increasing student understanding [33]. Teachers use a variety of assessment strategies to support learning [26]. Teaching, learning, or assessment greatly influences how to teach and what students learn or achieve [6]. Assessment is a key component of effective teaching and learning [22], and teacher competency assessment impacts teaching and learning outcomes [14].

Research [3] Supports the idea of greater involvement of teachers in the supervision process. Knowledge of increased supervision helps develop the professional identity of teachers [9]. Teachers' contributions to student learning should be part of the teacher evaluation system, along with evidence on the quality of teacher practice [12]. Improve professional formation despite internal and external challenges [32]. Academic supervision focuses on professional development and improvement of teaching practices. Supervisors need knowledge of school organization, professional development, and current education policies [13]. Through systematic planning and implementation, academic supervision helps teachers integrate various abilities, reflect on their practices, and ultimately improve their professionalism [23]. Supervision leads to better teaching and learning activities and student learning outcomes. Effective academic supervision allows action to address academic problems [21]. Teachers need to adapt teaching styles to educational goals [11]. Education is an indispensable function of society that began at the beginning of human existence and continues today [2].

The study's results are expected to significantly contribute to academic supervision in kindergarten schools by providing a practical and efficient model that principals can adopt in performing their supervision duties. This model is also expected to provide theoretical and practical benefits for education practitioners, school supervisors, and kindergarten teachers.

THEORETICAL BACKGROUND

1. The relationship between supervision and performance

Direct and indirect supervision have a profound impact on performance. In education, academic supervision by principals is critical to improving teacher performance [9], as evidenced by the significant correlation between these variables [33]. This relationship is further supported by the finding that supervision improves teacher performance [37]. Teacher supervision plays an important role in providing guidance and feedback for teachers to improve teaching quality and organizational commitment [16]. Effective supervision by school principals can significantly affect teacher performance, leading to improved teaching and learning outcomes [35].

Academic supervision plays an important role in improving teacher performance by providing professional support, guidance, and feedback [30]. Supervision helps teachers develop their skills, overcome weaknesses, and improve their professionalism [2]. Supervision fosters a conducive work environment, ensures adherence to standards, and promotes continuous improvement in teaching practices [30]. Principal supervision, leadership, and support are key factors influencing teacher performance and emphasize the importance of continuous evaluation and development. Overall, academic supervision is important in promoting teacher growth, improving education quality, and benefiting student learning outcomes.

2. Pre Test and Post Test as measuring instruments

Pre-test and post-test assessments are valuable tools in educational research to measure the impact of interventions on teacher performance and student learning outcomes [20]. By comparing pre- and post-program or intervention outcomes, researchers can assess the effectiveness of different teaching methods and strategies [29]. These assessments assist in evaluating changes in knowledge, skills, attitudes, and performance levels, providing insight into the effectiveness of educational initiatives [15]. Using a pre-test and post-test design allows for a comprehensive evaluation of the impact of the intervention on teacher development and student learning [10].

RESEARCH METHODS

1. Research model

This study used an experimental design with a quantitative approach, using the One-Group Pretest-Posttest research design. The research model is arranged as in Figure 1. Research analysis was carried out using 2 tests. In the research model, academic supervision acts as an independent variable and performance as a dependent variable, while the pretest and posttest measure instruments.

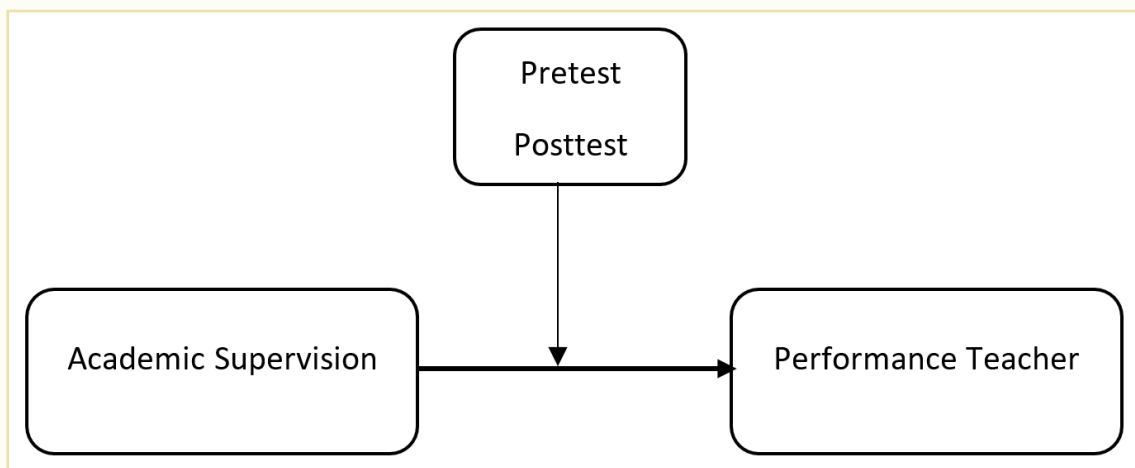


Figure 1 Research model

2. Participants and data collection

This study was conducted in kindergarten schools in Brebes Regency, Indonesia. The population in this study was kindergarten teachers in Brebes Regency. The sample in this study was six teachers from 6 different schools. Tests conducted on teachers were given and explained in advance by the Principal. The tests carried out include the pre-test, which is carried out before the application of the supervision model, and the post-test, which is carried out after the development of the academic supervision model. The test data collection technique uses a written test of multiple choice questions, namely the before and after tests totaling 30 items. The academic supervision model is applied in Figure 1.

3. Data analysis

The research technique used in this research is quantitative data analysis. The average test scores before and after the test of the two research variables will be tested for normality first and then analyzed using the appropriate data. Data analysis with normal normality test results of homogeneous data Parametric Technique T-test, while the analysis of normal normality of heterogeneous data using Non-Parametric Technique Wilcoxon Paired Test. The average test scores before and after treatment are categorized in the interpretation of the N-Gain Test.

N-gain was conducted to test the effectiveness of the treatment given. The pre-test and post-test results in the teacher group are the data used to determine the increase in the principal's academic supervision results. The data was analyzed to see the test results scores, and the average was calculated. After knowing the average, the Normalized Gain (N-gain) between the pre-test and post-test is calculated. It can be known by using the N-gain statistical formula [24].

$$N - Gain = (\text{Score Post Test} - \text{Score Pre Test}) / (\text{Score Maksimal} - \text{Score Pre Test})$$

The results of the calculation are interpreted using normalized gain according to [24] In Table 1.

Tabel 1

N-Gain Score Acquisition Criteria

Limitations	Category
$0,7 < g < 1$	G- High
$0,3 \leq g \leq 0,7$	G-Medium
$0 < g < 0,3$	G-Low

STUDY RESULTS

1. Descriptive Analysis

Figure 1 shows the supervision model applied to the treatment after the pretest and before the posttest. Descriptive analysis of pretest teacher academic supervision scores in Table 2. The pretest score before applying the academic supervision model was the highest score of 17 and the lowest score of 15.

Table 3 shows the post-test observation data. All respondents' scores increased, with the highest score of 29 and the lowest score of 28.

Table 4 describes the Pretest and Posttest results, including the Mean, 95% Confidence Lower Bound, Interval for Mean Upper Bound, 5% Trimmed Mean, Median, Variance, standard deviation deviation, Minimum, Maximum, Range, Interquartile Range, Skewness, and Kurtosis.

The results of the descriptive analysis showed that there was an improvement in teacher performance after the implementation of the academic supervision model. The pretest scores, which ranged from 15 to 17 with an average of 16.33, showed that before the application of the model,

teacher performance was at a relatively low level. However, after the implementation of the model, the posttest scores, which ranged from 28 to 29 with an average of 28.33, showed a significant improvement. The higher variance (0.667) in the pretest indicates that the pretest values had a larger spread. This could indicate that the initial level of teacher performance varied widely. The lower variance (0.267) in the posttest indicates that after the implementation of the model, teacher performance scores became more uniform and concentrated on higher scores. This indicates that the academic supervision model is effective in leveling out teacher performance levels. The negative skewness (-0.857) indicates that the distribution of pretest scores is skewed towards lower values, while the negative kurtosis (-0.300) indicates a distribution that is flatter than a normal distribution. Positive skewness (0.968) indicates that the distribution of posttest scores is skewed towards higher values, while negative kurtosis (-1.875) indicates a distribution that is more tapered than a normal distribution. This indicates that after the implementation of the model, the majority of teachers experienced significant performance improvements. The level of comparison between the pre-test and post-test results of Academic Supervision can be seen in Figure 3.

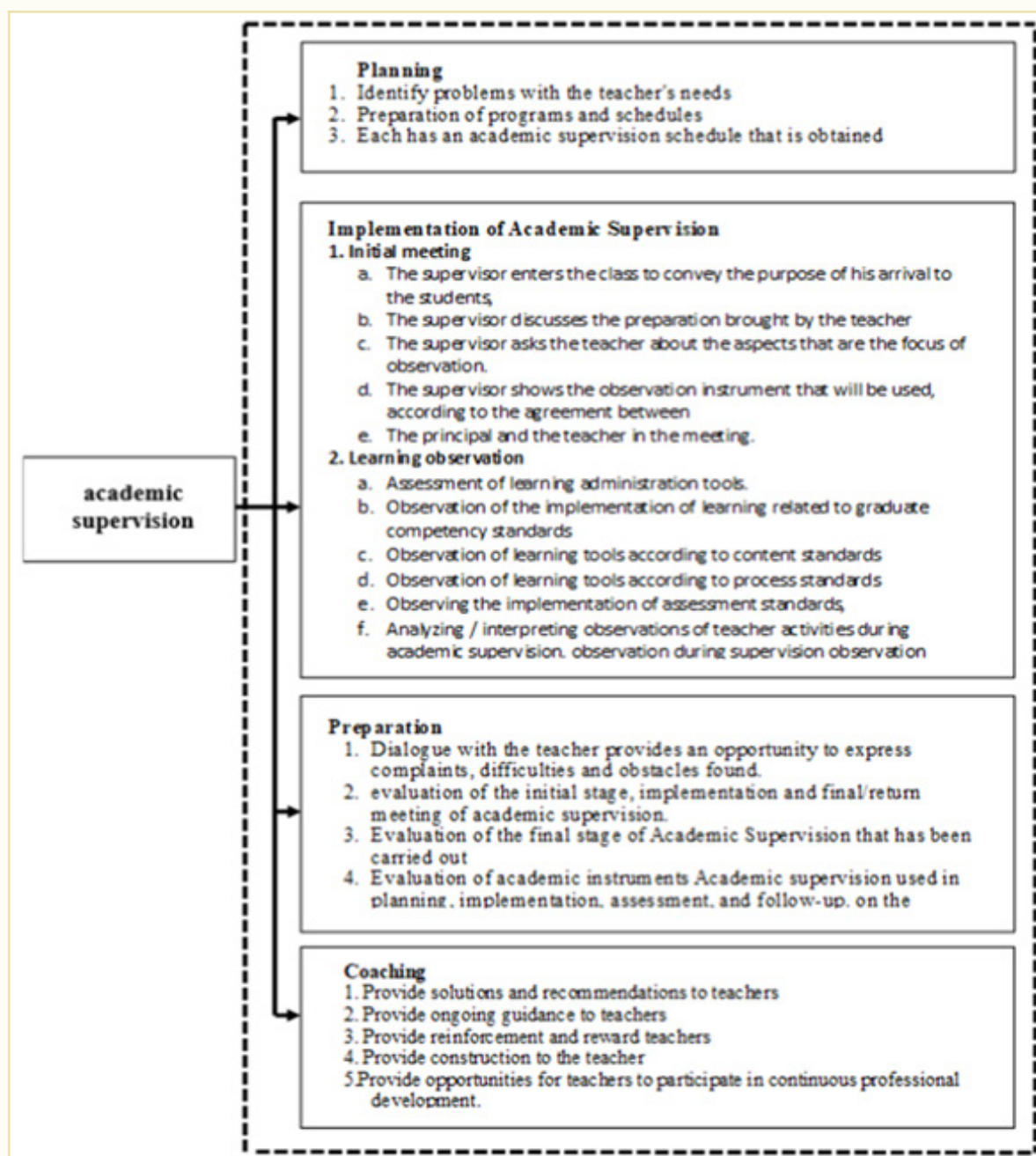


Figure 2 Supervision Model

Table 2

Observation Pretest Results

No.	Respondents	Pretest Score
1.	Teacher 1	16
2.	Teacher 2	17
3.	Teacher 3	16
4.	Teacher 4	17
5.	Teacher 5	15
6.	Teacher 6	17

Table 3

Observation Post Test Results

No.	Respondents	Pretest Score
1.	Teacher 1	28
2.	Teacher 2	28
3.	Teacher 3	28
4.	Teacher 4	29
5.	Teacher 5	29
6.	Teacher 6	28

Table 4

Descriptive Statistic

Descriptives				
			Statistic	Std. Error
Pretest	Mean		16.33	.333
	95% Confidence Interval for Mean	Lower Bound	15.48	
		Upper Bound	17.19	
	5% Trimmed Mean		16.37	
	Median		16.50	
	Variance		.667	
	Std. Deviation		.816	
	Minimum		15	
	Maximum		17	
	Range		2	
	Interquartile Range		1	
	Skewness		-.857	.845
	Kurtosis		-.300	1.741
Posttest	Mean		28.33	.211
	95% Confidence Interval for Mean	Lower Bound	27.79	
		Upper Bound	28.88	
	5% Trimmed Mean		28.31	
	Median		28.00	
	Variance		.267	

Std. Deviation	.516	
Minimum	28	
Maximum	29	
Range	1	
Interquartile Range	1	
Skewness	.968	.845
Kurtosis	-1.875	1.741

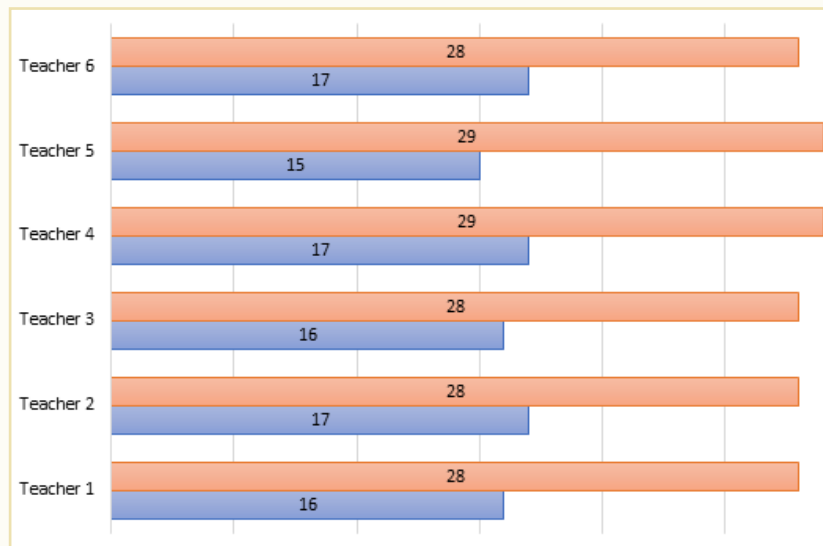


Figure 3 Comparison of Pre-Test Results and Post-Test Results

2. Data Normality Test

The instrument in this study tested the results of the application of academic supervision. The normality test was carried out using the Liliefors Test results in Table 3. The pretest data were normally distributed ($p = 0.091$), indicating that scores at the initial stage followed a normal distribution pattern. This is important to ensure that comparisons between pretest and posttest can be made assuming a normal distribution. The post-test data was not normally distributed ($p = 0.001$). This distribution mismatch may be due to high scores after implementing the academic supervision model. This limitation should be considered when interpreting the results, as statistical tests that require the assumption of normality may be less appropriate.

Table 5

Shapiro-Wilk Normality Test Results Pretest and Posttest

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.293	6	.117	.822	6	.091
Posttest	.407	6	.002	.640	6	.001

a. Lilliefors Significance Correction

Figure 4 and Figure 5 show the results of the normality test using a scatter plot to help visualize the distribution of scores. Although the pretest data showed a more uniform distribution pattern, the posttest data showed a high concentration of values that may have affected the distribution. The following results from the normality test using the scatter plot in Figure 2

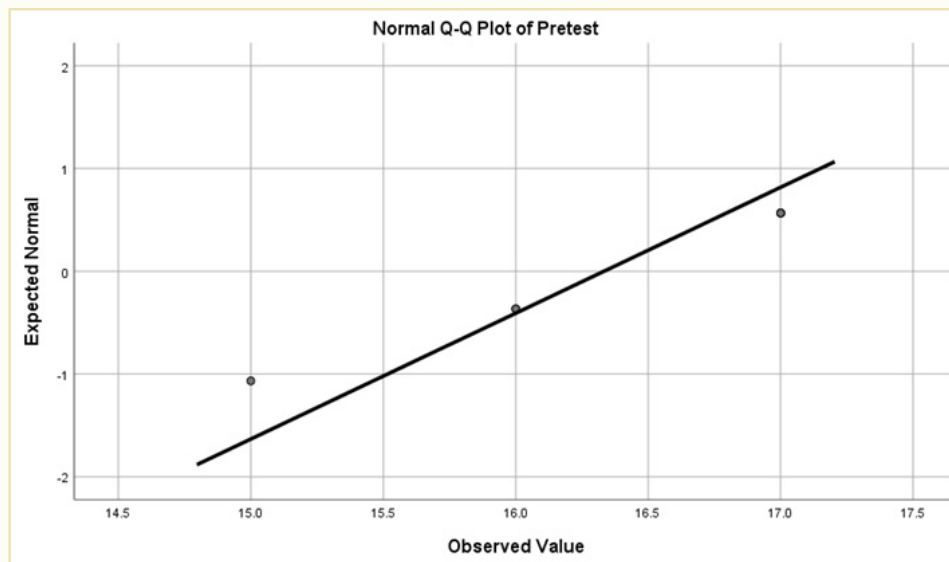


Figure 4 PreTest Normality Test Results

The next normality test for the Post-test is shown in Figure 5.

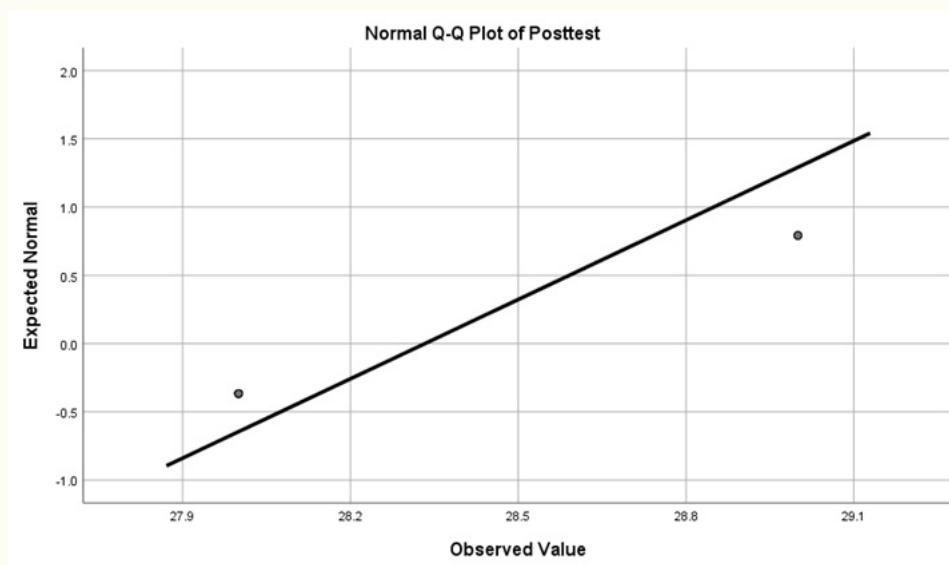


Figure 5 Post Test

3. Correlation Test

Table 6 shows that the pre-test and post-test data get a significant value of 0.541. This value is greater than 0.05, so there is a relationship between the post-test and pretest.

Table 6

Relationship between Post Test and Pretest

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pretest & Posttest	6	-.316	.541

Table 7

T Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-12.000	1.095	.447	-13.150	-10.850	-26.833	5	.000

The t-test results show a significance value of 0.000 ($p < 0.05$), which indicates a significant difference between pretest and posttest scores. This indicates that applying the academic supervision model has a strong influence on improving teacher performance. This significantly affects the difference in treatment given to each variable.

The obtained scores were then tested using the Wilcoxon signed rank test using SPSS to compare the difference between the two means of the initial and final scores. The calculation results are in Table 8.

Table 8

Wilcoxon Test Analysis

		N	Mean Rank	Sum of Ranks
Posttest - Pretest	Negative Ranks	0 ^a	.00	.00
	Positive Ranks	6 ^b	3.50	21.00
	Ties	0 ^c		
	Total	6		

Based on this data, a negative rank means no one has decreased because the value is 0. Looking at the increase in positive rank, there is an increase from the pretest to the post-test. There are no ties of the same value; the results show that there is an increase from the pre-test to the post-test test.

Table 9

Wilcoxon Test Results

	Posttest - Pretest
Z	-2.232 ^b
Asymp. Sig. (2-tailed)	.026
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

The table above shows the statistical test results with the Wilcoxon signed rank test results -2.232 and Asymp.Sig. (2-tailed) for a two-sided test is 0.026. The Wilcoxon test results, which show a $p\text{-value} = 0.026 < 0.05$, support the t-test results and show that the difference between the pretest and posttest is significant. The Wilcoxon test is used because the post-test data is not normally distributed, and the results show that the academic supervision model is effective in improving teacher performance, so the hypothesis is accepted that there is an effect of using the academic supervision model to improve teacher performance.

The academic supervision model developed by the researcher can achieve the objectives of supervision. This means that if this supervision model is used as a tool and implemented in each education unit on an ongoing basis, the results are equivalent to even better than the general supervision carried out by the principal, namely in achieving the objectives of supervision.

The limited academic supervision tested, with six teacher respondents, was declared feasible for use in kindergarten schools. The feasibility is seen in supervision objectives, implementation techniques, supervisors, and self-motivation. This proves that the achievement of supervision objectives will not appear in one supervision implementation because academic supervision must be carried out continuously to optimally achieve the objectives of supervision.

The next test is the N-Gain in Table 10; each score gains value on each respondent, and in Table 11, the N-Gain value.

Table 10

Score N-Gain

Respondent	Pre Test	Post Test	score gain
Teacher 1	16	28	0,857143
Teacher 2	17	28	0,846154
Teacher 3	16	28	0,857143
Teacher 4	17	29	0,923077
Teacher 5	15	29	0,933333
Teacher 6	17	28	0,846154
Average	16,33333	28,33333	0,877167

All respondents showed high N-Gain scores, indicating that each teacher experienced improved performance after implementing the model. This supports the finding that the academic supervision model effectively improved performance consistently among all respondents.

Table 11

Average N-Gain

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
NGain	6	.85	.93	.8772	.03997
Valid N (listwise)	6				

Table 11 shows the N-gain value of the pretest and posttest results with a value of 0.8772; it can be concluded that using the academic supervision model, there is a difference in teacher performance before using the academic supervision model and after using the academic supervision model with an acceptable increase afterward.

The average N-Gain value of 0.8772 indicates a significant increase in performance from pretest to posttest. N-Gain measures the relative change in performance, and this value indicates that the academic supervision model had a large impact on improving teacher performance.

DISCUSSION

The results of this study indicate that the application of the academic supervision model is effective in improving teacher performance. This is evidenced by the significant increase in posttest scores compared to pretest scores. The average pretest score of 16.33 increased to 28.33 in the posttest. This change shows that academic supervision positively impacts teachers' professional competence. In the context of theory, academic supervision is a systematic approach to guiding and evaluating teacher performance [36]. Academic supervision involves a process of observation, feedback, and professional support aimed at improving teaching effectiveness [18]. The results of this study are in line with the theory, where academic supervision is proven to be able to improve teacher competence and performance.

Statistical analysis showed that the variance of the pretest scores was higher than the variance of the posttest scores. This indicates that before the implementation of the supervision model, there were greater performance differences among the teachers. However, after the intervention, teachers' performance became more uniform, which is reflected in the decrease in variance. This indicates that the academic supervision model was successful in levelling the level of teacher performance [27]. Educational supervision theory states that one of the goals of supervision is to create consistent teaching quality standards. This study reinforces this theory by showing that academic supervision can reduce variations in teacher performance and improve overall teaching standards [7].

A normality test using Shapiro-Wilk showed that the pretest data was normally distributed, while the posttest data was not. This distribution discrepancy may be due to the significant increase in performance scores after the implementation of the model. The non-normal distribution of the post-test data could be due to the increased homogeneity of the scores, indicating that all teachers had reached a higher level of performance after the intervention. Previous research emphasizes the importance of continuity in the supervision program to achieve optimal results [25]. The results of this study support this view, showing that sustained implementation of the academic supervision model can result in significant and uniform improvements in teacher performance [19].

The correlation between pretest and posttest scores showed a significant relationship. Although this correlation is not very strong, it shows a measurable improvement in teacher performance from before to after the intervention. In addition, the t-test and Wilcoxon Signed Rank Test results showed a significant difference between the pretest and post-test scores. This indicates that the improvement in teacher performance after implementing the academic supervision model is significant. These results are consistent with the findings from the study, which showed that effective supervision can produce significant changes in teaching practices and student learning outcomes. This study adds evidence that structured supervision interventions can significantly improve teachers' professional performance [8].

N-Gain was used to measure the relative improvement in teacher performance. It showed a highly significant increase in performance from pretest to posttest. This means that the academic supervision model not only successfully improved teacher performance but also made the improvement measurable and significant.

CONCLUSION

This study showed that implementing an academic supervision model significantly improved teacher performance in kindergarten. This improvement was measured through changes in pretest and posttest scores and a decrease in performance variability among teachers. There was a difference between teacher performance before and after using the supervision model. An effective academic supervision model can be an important tool in teacher professional development, especially at the early childhood education level. Structured and continuous supervision can improve teaching quality and student learning outcomes. Educational institutions and policymakers should consider implementing the academic supervision model more widely. The program could be part of ongoing professional development and teacher training. Further research with larger samples and

longer duration is needed to validate these findings. Further studies could also explore the impact of academic supervision on other aspects of teacher performance, such as job satisfaction and teacher retention. With results showing significant improvements in teacher performance, this study provides strong evidence that academic supervision is an effective strategy in teacher professional development. Wider and sustained implementation of this model is expected to result in more equitable and sustainable improvements in education quality.

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Authors

Wiwik Hidayati

(Indonesia, Semarang)

Doctoral Student, Education Management Study Program
Universitas Negeri Semarang

E-mail: hidayatiwiwik93@students.unnes.ac.id

ORCID ID:0009-0002-3074-8389

Tri Joko Raharjo

(Indonesia, Semarang)

Professor, Faculty of Education and Psychology, Department
of Nonformal Education

Universitas Negeri Semarang

E-mail: trijokoraharjo@mail.unnes.ac.id

Scopus Author ID:57207728876

Joko Sutarto

(Indonesia, Semarang)

Professor, Faculty of Education and Psychology, Out of
School Education Study Program Postgraduate Program

Universitas Negeri Semarang

E-mail: jokotarto@mail.unnes.ac.id

Scopus Author ID:57211534056

Widiyanto

(Indonesia, Semarang)

Professor, Faculty of Economics and Business, Economics
Education Study Program Postgraduate Program

E-mail: wied@mail.unnes.ac.id

ORCID ID:0000-0003-1072-016X

Scopus Author ID:57195345403

Author's contribution

Wiwik Hidayati: Conceptualization, Methodology

Tri Joko Raharjo: Formal Analysis, Validation

Joko Sutarto: Data Curation, Supervision

Widiyanto: Visualization, Writing-Review and Editing

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